In the Title:

Please replace the title of the application with "A MAGNETIC TUNNEL JUNCTION SENSOR WITH STABILIZATION PROVIDED BY NON-CONDUCTING ANTIFERROMAGNETIC MATERIAL".

In the Specification:

On page 9, following line 21, please add the following paragraph.

In the following figures, AF and AFM both indicate an antiferromagnetic layer, PL indicates a pinned layer, FL indicates a free layer, H.B. and HM both indicate hard bias material, TB indicates a tunnel barrier, I1 is a first insulation layer, I2 is a second insulation layer, P1 is a first pole, P2 is a second pole, and G1 is a first gap.

Please replace the paragraph beginning on page 5, line 1 with the following amended paragraph.

Fig. 1A shows an illustrative embodiment of a magnetic tunnel junction (MTJ) sensor 10 from the prior art. Sensor 10 is viewed from the air bearing surface (ABS) so that, in operation, the magnetic medium (not shown) moves in the image plane vertically with respect to MTJ sensor 10. MTJ sensor 10 includes an MTJ stack 12 disposed between a first shield (S1) layer 14 and a second shield (S2) layer 16. MTJ stack 12 may be characterized as an upper electrode 18 separated from a lower electrode 20 by a tunnel barrier 22. Upper electrode 18 includes a ferromagnetic (FM) pinned layer 24 having a magnetic moment that is pinned by an exchange-coupled antiferromagnetic (AFM) layer 26, and a second lead (L2) layer ~~28~~. The lower electrode 20 includes a FM free

layer 30 and a first lead (L1) layer 32. MTJ stack 12 operates in the usual manner known in the art except that the stabilization biasing of free layer 30 is provided by a hard magnetic (HM) layer 34 disposed on each side of MTJ stack 12. To prevent a loss of sensitivity from undesired sense current shunting, HM layers 34 are sandwiched between two insulating layers 36 and 38 substantially as shown. Practitioners in the art can readily appreciate that the several layers outside of MTJ stack 12 should be precisely created in a series of steps following an initial etching procedure. The usual processes known in the art give rise to misalignment between the narrow ends of the various layers at the edges of MTJ stack 12, leading to unit performance variations and high unit rejection rates.

Please replace the paragraph beginning on page 13, line 7 with the following amended paragraph.

Figs. 4A and 4B show schematic representations of the ABS of exemplary MTJ sensor embodiments of this invention wherein the free layer stabilization is provided using conductive AFM layers separated from the MTJ stack by thick insulation layers, similarly conceptually to the discussion above in connection with Figs. 3A and 3B. In Fig. 4A, the top MTJ sensor 166 includes the active region 168 disposed between the two side regions 170 and 172. Operation and fabrication of MTJ sensor 166 may be appreciated with reference to the above discussion of Fig. 3A except that, instead of HM layer 138 (Fig. 3A), MTJ sensor 166 uses the conductive AFM layers 173 to provide stabilization of the FM free

layer 174. By permitting conductive as well as non-conductive materials to be considered for second AFM layer ~~172~~ 173, a wider range of choices is made available for resolving material conflicts between second AFM layer ~~172~~ 173 and the first AFM layer 176.